

10/510313 510, 316

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
23 October 2003 (23.10.2003)

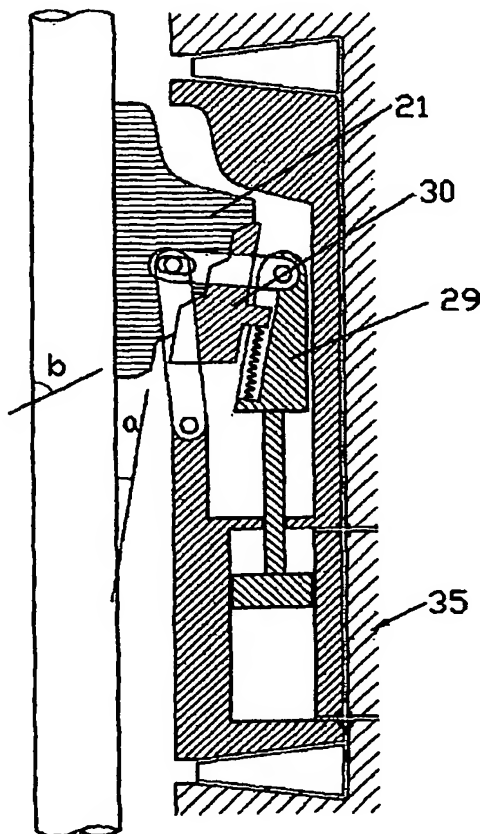
PCT

(10) International Publication Number
WO 03/087528 A1

- (51) International Patent Classification⁷: **E21B 19/07**, 19/10
- (21) International Application Number: PCT/GB03/01410
- (22) International Filing Date: 1 April 2003 (01.04.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0207908.5 5 April 2002 (05.04.2002) GB
- (71) Applicant (for all designated States except US): **MARIS TDM LIMITED** [GB/GB]; Knightway House, Park Street, Bagshot, Surrey GU19 5AQ (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **AYLING, Laurence, John** [GB/GB]; Maywood Lodge, Maywood Drive, Camberley, Surrey GU15 1LH (GB).
- (74) Agent: **COHEN, Alan, Nicol**; 2 Grove Place, Tatsfield, NR Westerham, Kent TN16 2BB (GB).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: IMPROVED SLIPS



(57) Abstract: Slips (1, 21, 41) for engaging any jointed, coiled or flexible tubular with substantially no scoring, gouging or scraping, such as when supporting a drill string in a borehole or gripping a tubular (2, 22) during the connection or disconnection of a tool joint or pulling a cable or pipeline; additionally, applying a pre-determined minimum gripping force in order to avoid rotary slippage when the weight of the string is insufficient to achieve a conventional slips action; additionally, including a coarse wedge (30, 50) to take up the extra travel of a worn tool joint or a tubular of smaller diameter, with a means to ensure that the coarse wedge acts before the fine wedge (29, 49) does and a means to ensure that the wedging action remains if the actuating force is removed; additionally, including a secondary slips (40) to interfere with the upset on the tool joint to avoid relying on friction to support the string and a means of integrating this with the gripping slips and ensuring that the secondary slips act first; additionally, the application of these attributes 'upside down' to achieve the action of snubbing when forcing a tubular into compression instead of tension for any reason.

WO 03/087528 A1